

Biodiversity Strategy



Conserving biodiversity and
using biological resources
in a sustainable manner

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Biodiversity Strategy: Conserving biodiversity and using biological resources in a sustainable manner.

June 2009

Cover Photos:

Little southwest Miramichi River
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Raccoon
Procyon lotor
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Green Frog
Rana clamitans
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Fiddlehead
Matteuccia struthiopteris
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River Jewelwing
Calopteryx aequabilis
DNR Photo

Great Horned Owl
Bubo virginianus
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Lady's Slipper
Cypripedium acaule
CNB Photo



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BACKGROUND AND INTRODUCTION



The New Brunswick landscape is a blend of diverse landforms. These include three distinct coastlines, remnants of the northern Appalachian Mountains, steep rivers and sparkling lakes, and the broad valley of the lower St. John River. Associated with this physical diversity is a wealth of biological diversity – the diversity of living things.



Biodiversity Definitions

The term *biodiversity* is a contraction of *biological diversity*. It refers to life in all its forms and the ecosystems and natural processes that support this life. New Brunswick's biodiversity is found on its coasts, in its streams, rivers and lakes, in its bogs and marshes, in its abundant forest, and in its farms, towns and cities.

The components of biodiversity are:

- **Genetic diversity**, which is the variation among individuals of the same species
- **Species diversity**, which is the variety of animals, plants and microorganisms, and
- **Ecosystem diversity**, which is the variety of habitats or ecosystems.

An ecosystem is a functional unit consisting of all the living organisms in a given area and all the non-living components of their shared environment, linked together through nutrient cycling and energy flow. Ecosystems can be of any size, from the lichen community on a tree stump to the watershed of a large river. Generally, the size chosen depends on the required detail of an assessment, research project or management application.

Importance of Biodiversity

Biodiversity has ecological value; for example, ecosystems provide diverse habitat for species, interrelationships among species allow ecosystems to function, and variation in genetic makeup allows species to adapt to changing environments. Our current biodiversity is the result of millions of years of evolution and it forms the building blocks for continuing this process.

Healthy ecosystems carry out a diverse array of processes that provide services to humanity. These include: *provisioning* services such as the provision

of food, water, pharmaceuticals, timber and fibre; *regulating* services such as the regulation of climate, flooding, waste and water quality, and *supporting* services such as soil formation, photosynthesis, pollination and nutrient cycling.

Though more difficult to quantify, biodiversity also provides considerable cultural, spiritual and aesthetic values - much of our sense of belonging and heritage comes from our relationship with the landscape in which we live. Finally, many consider that biodiversity has *intrinsic* value - that it has worth in and of itself, independent of anyone or anything else.

Why is a Strategy Needed?

Our ecosystems are resilient, in that they recover well from most disturbances and they have evolved in an environment of continuous change. But they do not adapt well to rapid and persistent changes, such as those that result from many human activities. Our activities disrupt biodiversity at the genetic, species or ecosystem scale via five primary mechanisms:

- **Habitat loss:** the conversion or alteration of natural ecosystems for such things as urban development, hydroelectric power, transportation and energy corridors, agriculture, mining and forestry.
- **Invasive alien species:** the introduction of species into areas outside of their natural ranges where they are disruptive to local species and ecosystems.
- **Unsustainable use:** the use of biological resources at a rate beyond the capacity of ecosystems to replenish them.
- **Pollution:** the contamination of ecosystems with elements or compounds that disrupt ecosystem functions, and
- **Climate change:** significant and rapid changes in average weather patterns, which can include changes in temperature and precipitation.

Over the past 50 years, humans have changed ecosystems more rapidly and extensively than at any comparable period of history, largely to meet growing demands for food, fresh water, timber, fibre and fuel. The changes have contributed to substantial gains in human well-being and economic development but have resulted in substantial and largely irreversible losses of biodiversity. Of particular concern is the likelihood of abrupt changes in ecosystem state resulting from cumulative human interventions, such as occurred with the collapse of Atlantic cod stocks in 1992 (Millennium Ecosystem Assessment 2005).

The global threat to biodiversity was formally acknowledged in 1992 with the signing of the *United Nations Convention on Biological Diversity* (United Nations Environment Programme 1992). The stated goals of the convention are the conservation of biodiversity, the sustainable use of biological resources, and the fair and equitable sharing of

benefits arising from the use of genetic resources. The Canadian response to the Convention came in 1995 with the publication of the *Canadian Biodiversity Strategy* (Environment Canada 1995), which has five goals:

- To conserve biodiversity and use biological resources in a sustainable manner
- To improve our understanding of ecosystems and increase our resource management capability
- To promote an understanding of the need to conserve biodiversity and use biological resources in a sustainable manner
- To maintain or develop incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources, and
- To work with other countries to conserve biodiversity, use biological resources in a sustainable manner and share equitably the benefits that arise from the utilization of genetic resources.



Green Frog
Rana clamitans
DNR Photo

As a follow-up and complement to the Canadian Biodiversity Strategy, the Canadian Council of Resource Ministers produced the document *A Biodiversity Outcomes Framework for Canada* (Canadian Council of Resource Ministers 2006). The Framework provides an approach to identifying management priorities based on identifying desirable biodiversity outcomes (the “what”) and needed management outcomes (the “how”). The biodiversity outcomes are related to healthy ecosystems, viable species, genetic resources with adaptive potential and the sustainable use of biological resources. Management outcomes are presented as improvements to the processes with which we assess the state of biodiversity, plan the management of our natural resources, and track and review our performance at implementation.

The loss of biodiversity and the risks to the services it provides are indisputable. Although New Brunswick is relatively rich in biodiversity – a result of good stewardship, resilient ecosystems and a low human population – there is still need for our attention. An important indicator of biodiversity is the status of vulnerable species. The most recent assessment of 2,362 New Brunswick plants and animals indicated

that 33 species are at risk of disappearing from the province or have already done so (three of those are extinct everywhere). In addition, 406 species were identified as meriting particular attention to their status.

New Brunswick has embarked on a process of change as we strive to achieve self-sufficiency by the year 2026 (Province of New Brunswick 2007). To this end, we are actively pursuing increased industrial productivity and competitiveness, increased investment from large industries, the development of new markets, the diversification of resource-based industries, the establishment of a regional focal point for energy production and distribution, and an increased population. Self-sufficiency will benefit the people of New Brunswick but it also increases the challenges we face in maintaining biodiversity values. Given the increased risk to biodiversity posed by development, and the relatively good position we still find ourselves in, the time is right to build on international and Canadian initiatives by creating a strategy intended specifically for New Brunswick – one that will allow us to develop actions that will work here, in New Brunswick.



Fisher
Martes pennanti
Photo Canada

New Brunswick's Biodiversity Strategy

The New Brunswick Biodiversity Strategy is intended as a step towards including an awareness of biodiversity in all aspects of our lives. It is about developing and using our biological resources in such a way that we live off of nature's interest without depleting its capital. The strategy provides broad direction, rather than specific actions, and will serve as a starting point from which to plan those actions. Specifically, the strategy is intended to do the following:

- **Reaffirm** New Brunswick's commitment to do its part to achieve the national goals described in the Canadian Biodiversity Strategy (1995) and the Biodiversity Outcomes Framework for Canada (2006)
- **Identify** New Brunswick biodiversity goals and outcomes that Government will work within its capacity and with willing partners to achieve
- **Describe** a biodiversity management framework that will facilitate a coordinated, collaborative approach to biodiversity conservation
- **Discuss** the importance of stewardship in biodiversity conservation and the role that Government can play, and
- **Identify** high-level strategic management outcomes that will move the biodiversity management process forward in New Brunswick.

The strategy is presented in three sections in the remainder of this document:

Chapter 1: Biodiversity – Vision to Goals:

A vision for biodiversity in New Brunswick; the scope and focus of this strategy; the guiding principles used in its development; the Province's goals for biodiversity; and a set of desired biodiversity outcomes.

Chapter 2: Biodiversity Management Framework:

A leadership, coordination and reporting structure for biodiversity, a discussion of stakeholder involvement, and an introduction to the concepts of thresholds and targets, ecologically based management units, integrated planning, stewardship and action plans.

Chapter 3: Biodiversity Management Outcomes:

Twenty strategic management outcomes intended to guide the process forward.

Atlantic Salmon
Salmo salar
CNB Illustration



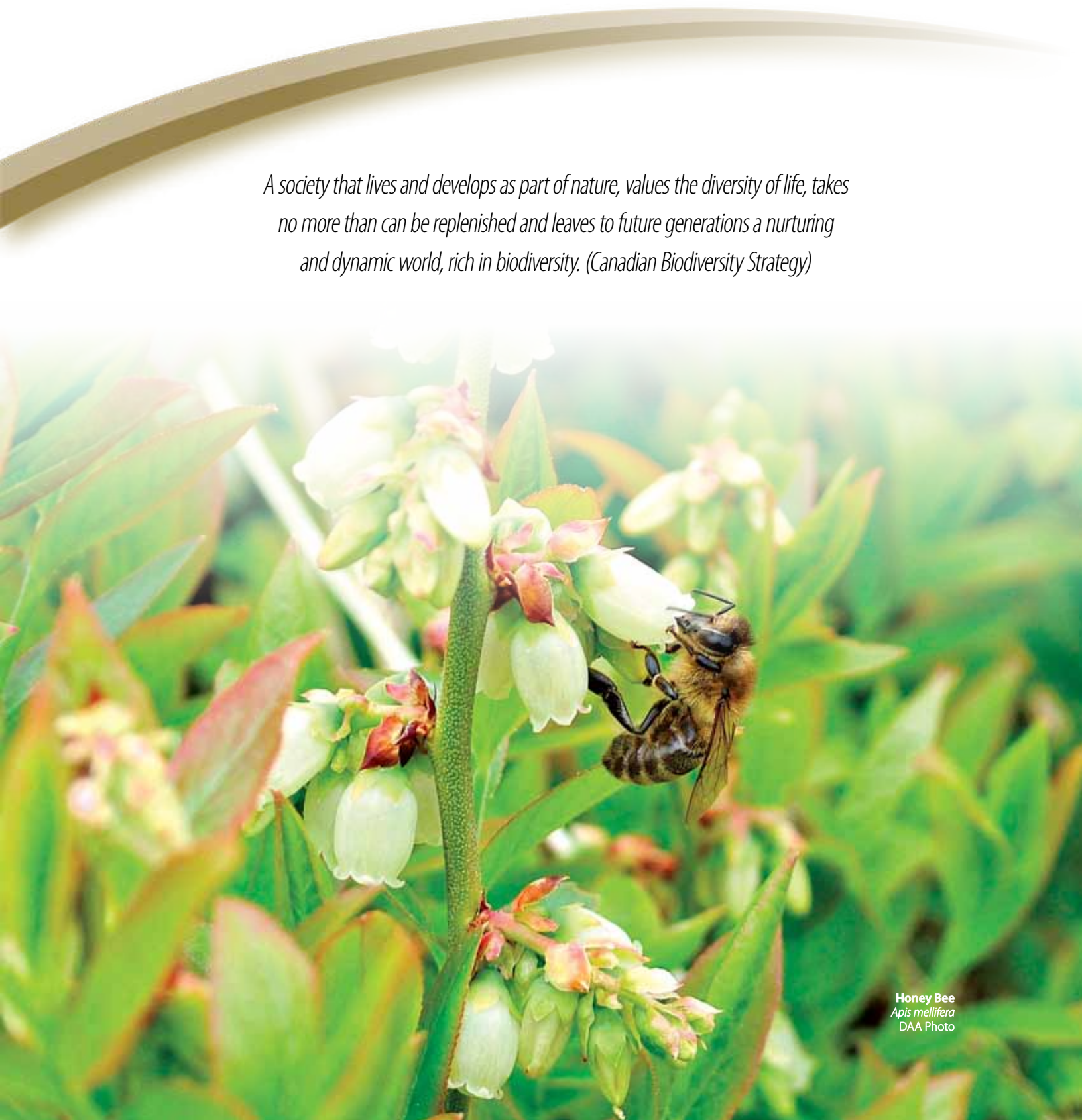
Lake Trout
Salvelinus namaycush
CNB Illustration



Chapter 1

BIODIVERSITY – VISION TO GOALS

A society that lives and develops as part of nature, values the diversity of life, takes no more than can be replenished and leaves to future generations a nurturing and dynamic world, rich in biodiversity. (Canadian Biodiversity Strategy)



This section lays out a vision for New Brunswick's biodiversity, provides information on the scope and focus of this strategy and the principles used in its development, and identifies the biodiversity goals and outcomes that it is designed to achieve.

VISION

A society that lives and develops as part of nature, values the diversity of life, takes no more than can be replenished and leaves to future generations a nurturing and dynamic world, rich in biodiversity. (Canadian Biodiversity Strategy)

SCOPE AND FOCUS

The scope of the New Brunswick Biodiversity Strategy is intentionally broad and inclusive to reflect the interests of New Brunswickers, regardless of which level of government has constitutional or legislative authority over conservation.

The scope includes all:

- Ecosystems
- Species
- Genetic resources
- Land ownerships, and
- Activities that affect biodiversity.

The Government of New Brunswick will focus its efforts on the issues and areas of work for which it has responsibility. These include terrestrial and coastal ecosystems, and most of the species that inhabit them, and a shared responsibility for aquatic and marine zones. As needed, the Government of New Brunswick will cooperate with the Government of Canada, First Nations, neighbouring jurisdictions, local governments, corporations, private organizations and landowners to ensure that the biodiversity interests of New Brunswickers are considered.

GUIDING PRINCIPLES

The strategy was developed and will be implemented with these guiding principles:

Multiple Values: Biodiversity has ecological, economic, social, cultural and intrinsic values.

Stewardship is a Shared Responsibility:

Everyone in New Brunswick . . .

- Is affected by biodiversity, and
- Is encouraged to contribute to its conservation and to use biological resources in a sustainable manner.

Public Participation:

Everyone in New Brunswick . . .

- Is encouraged to understand and appreciate the value of biodiversity, and
- To participate in decisions that affect its conservation and sustainable use.

Integrated Planning: Biodiversity is a cross-cutting issue, in that it touches the many ways we use our land, water and natural resources. It is best managed within a system that . . .

- Allows for the integration of relevant ecological, social and economic values
- Makes reference to biodiversity conservation and sustainable-use outcomes, and to biodiversity targets, and
- Considers the impacts of expected changes to the climate.

Knowledge and Precaution:

- Decisions about biodiversity should be made using all relevant information, including the best scientific and traditional knowledge available, and
- Where there is the potential of serious or irreversible harm to biodiversity, a lack of scientific certainty as to the likelihood or magnitude of that harm should not be used as a reason to not take preventative or corrective measures.

BIODIVERSITY GOALS AND OUTCOMES

The Government of New Brunswick will work within its capacity, and with willing partners, to achieve the following two biodiversity goals. Conservation and sustainable-use outcomes, which are interconnected, describe desired end states that will contribute towards achieving the goals.

Biodiversity Goals

1. Conservation of the genetic, species and ecosystem diversity of New Brunswick, and
2. Sustainable use and development of New Brunswick's biological resources.

Biodiversity is...

The variety and abundance of life in all its forms, and the natural processes that support that life.

Conservation is...

The protection, preservation, renewal, restoration or wise use of ecosystems or species such that their long-term viability is maintained.

Sustainable Use is...

The use of a biological resource (and the supporting soil and water) in a manner that allows its continued use.

plants and animals are maintained, and beneficial, non-invasive varieties are developed.

Invasive alien species

The impacts of invasive alien species are kept at a minimum and the likelihood of new introductions is significantly reduced.

Alien species are plants, animals or other organisms introduced by human action, whether intentional or not, into areas outside of their natural ranges. Introductions may be beneficial, such as most of our crops and livestock, neutral in effect or harmful.

Alien species are considered **invasive** when their introduction or spread threatens ecosystems and species, the economy or society.

Conservation Outcomes

Natural ecosystems and their biota

Healthy and resilient native ecosystems and viable populations of all native flora, fauna and other organisms are present and sustainable across their ecological ranges.

Species at risk

The status of species at risk is improved and there are no new extinctions due to human activity.

Genetic variability

Genetic variability of wild species is maintained via the management of ecosystems and populations.

Domesticated flora and fauna

Traditional species and varieties of domesticated

Sustainable Use Outcomes

Wild flora

The use of trees and other wild flora is sustainable over the long term.

Wild fauna

The use of fish and wildlife is sustainable over the long term.

Soil, water and air

Soil, water and air in managed ecosystems are healthy and able to support human use.

CHAPTER 2 BIODIVERSITY MANAGEMENT FRAMEWORK

Biodiversity targets can help to reduce conflicts between development and conservation interests via early identification of ecosystems and species that are of conservation concern.

This chapter describes the components of a biodiversity management framework for New Brunswick that will facilitate a coordinated, ecologically based approach to achieving the Province's biodiversity goals. The framework has nine components:

- LEADERSHIP AND COORDINATION
- STAKEHOLDER ENGAGEMENT
- BIODIVERSITY MANAGEMENT UNITS
- BIODIVERSITY ASSESSMENT AND INFORMATION SHARING
- BIODIVERSITY THRESHOLDS AND TARGETS
- INTEGRATED PLANNING
- STEWARDSHIP
- ACTION PLANS
- REPORTING

The framework provides for leadership and accountability and reflects the strategy's guiding principles.

The first component is a structure for the leadership and coordination of biodiversity initiatives, which is followed by a discussion of how stakeholders are engaged in the process. The third component describes the geographic management units within which biodiversity assessment is done, for which thresholds and targets are developed, and for which integrated planning is done - which are the next three components. The stewardship component provides the processes by which landowners, organizations and citizens can contribute to conservation and sustainable use. Action plans are the step beyond this strategy - crafting the details. Finally, reporting is intended as a way to ensure accountability and to measure progress.



LEADERSHIP AND COORDINATION

The leadership and coordination structure ensures oversight and accountability, and will facilitate a coordinated approach to the ongoing business of conservation and sustainable use of biodiversity. The structure involves deputy ministers, directors, managers and staff from the provincial government departments directly involved in regulating or managing the conservation and use of biodiversity. The Department of Natural Resources (DNR) is the provincial lead for the development and coordination of the strategy. The Departments of Agriculture and Aquaculture (DAA), Environment (ENV), and Local Government (DLG) are also responsible for management and regulation of significant aspects of biodiversity. They are co-leads in the delivery of the strategy and will ensure that their policies and programs are in line with strategy outcomes. Other provincial departments have the responsibility to recognize strategy outcomes in applicable policies and decisions.

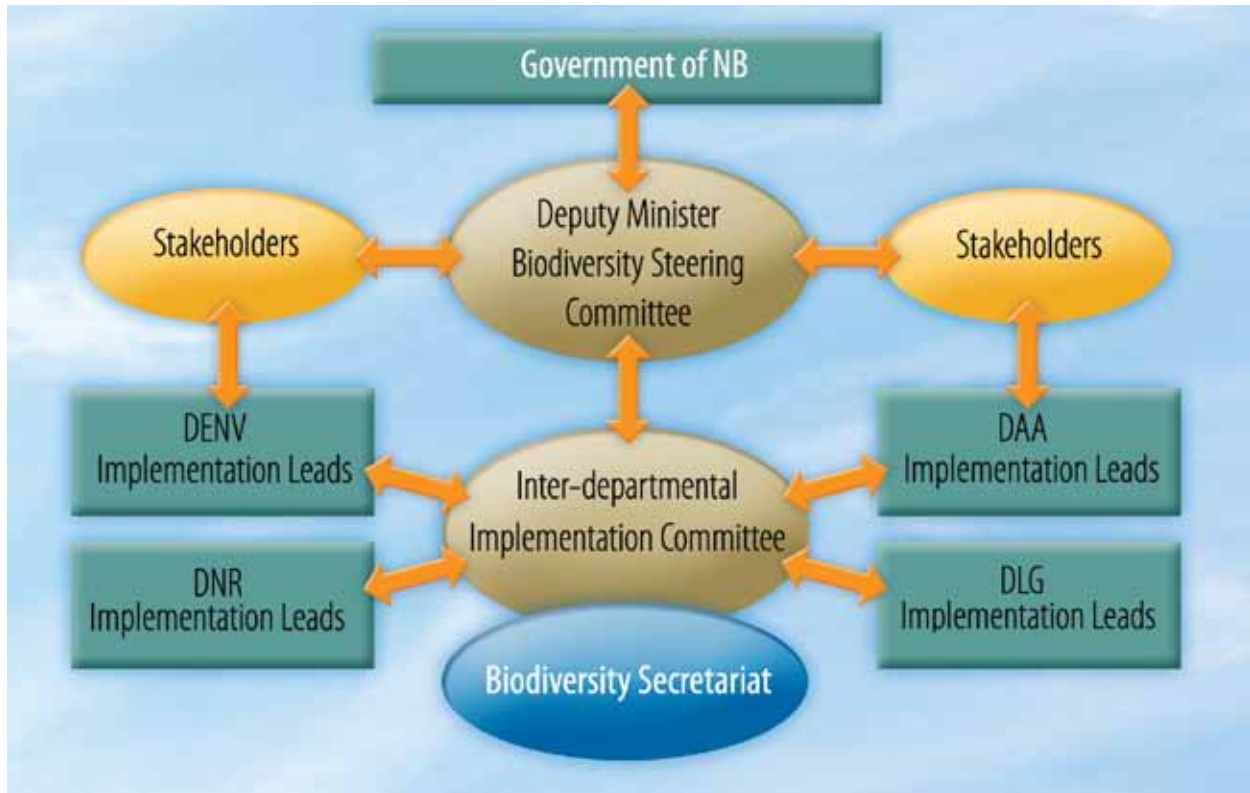
Deputy Minister Biodiversity Steering Committee

The Steering Committee is composed of the Deputy Ministers of Natural Resources, Environment, Agriculture and Aquaculture, and Local Government. It provides overall leadership and direction and liaises with Government and with provincial, territorial and federal counterparts. The Committee may establish stakeholder and citizen advisory groups as needed.

Inter-departmental Implementation Committee

The Implementation Committee is composed of program directors within DNR, ENV, DAA and DLG. It provides direction, coordination, integration and oversight to implementation, and liaises with the Steering Committee. The Committee may establish scientific and technical advisory committees as needed.

Brook Trout
Salvelinus fontinalis
CNB Illustration



Departmental Implementation Leads

Department leads are staff within DNR, ENV, DAA and DLG. They oversee the development and implementation of action plans, and the reporting on actions, indicators and the status of management outcomes.

New Brunswick Biodiversity Secretariat

The Biodiversity Secretariat is a program area within the Department of Natural Resources. It provides advisory, logistical, planning and reporting support to the steering and implementation committees and departmental leads. It also facilitates communication and awareness-building among stakeholders and collaborators, and provides a portal for citizen and stakeholder inquiries regarding the strategy and action plans.

STAKEHOLDER ENGAGEMENT

A stakeholder is a citizen or organization that has an interest in, or is potentially affected by, actions arising from this strategy. Stakeholder organizations may include federal and local governments, First Nations, governments of neighbouring jurisdictions, businesses, universities, environmental groups and a variety of other non-governmental organizations.

Stakeholder organizations will be invited to become engaged in defining and implementing actions associated with the strategy's management outcomes. The mechanisms of this engagement will be developed in cooperation with stakeholders. Engagement of the citizenry at large will occur via delivery of actions identified in the plans.



Claybank Tiger Beetle
Cicindela limbalis
DNR Photo

Government of Canada

The Government of Canada has a responsibility for the management and conservation of aquatic biodiversity (marine and inland), as well as for most of Canada's migratory bird species. Federal departments, such as Fisheries and Oceans Canada, Environment Canada, Agriculture and Agri-Foods Canada, Natural Resources Canada and the Canadian Food Inspection Agency, have policies and programs directed at achieving the goals of the Canadian Biodiversity Strategy. These are complementary to the goals and outcomes expressed in this strategy. Communication and collaboration with these Federal departments occurs through various intergovernmental forums on biodiversity conservation and sustainable use.

First Nations

The First Nation people of New Brunswick have the longest history of interaction with the Province's biodiversity. They will be asked to contribute their advice, expertise and knowledge towards achieving the goals and outcomes of the strategy.

BIODIVERSITY MANAGEMENT UNITS

The biodiversity goals and outcomes of this strategy apply to the Province in its entirety. The intentions and actions they inspire, however, are distributed throughout the province by means of biodiversity management units. Specifically, management units are the geographic areas for which thresholds and targets are set, and in which activities are directed and indicators are monitored. The size and location of management units will vary with the value being considered, and are not necessarily the same for conservation and sustainable use.

Most resource and development sectors have management or planning units already defined, and this strategy does not propose changes to those units.

Conservation Management Units

Conservation management units are described from the geographic extents of enduring features of the landscape, such as geology, topography, soil and drainage pattern. These features play an important role in the distribution of species and ecosystems. One set of nested management units are, therefore, proposed for terrestrial and coastal ecosystems and another set for aquatic and wetland systems.



Small Round-leaved Orchid
Amerorchis rotundifolia
DNR Photo

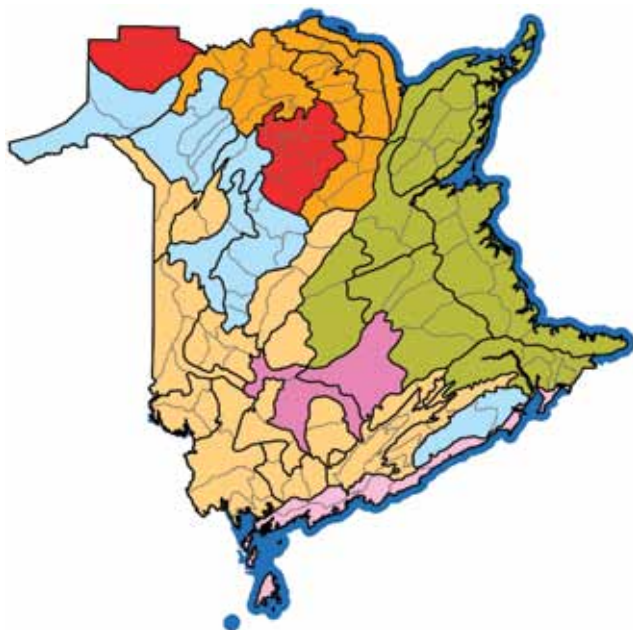
Terrestrial and Coastal Biodiversity

New Brunswick's Ecological Land Classification (ELC) describes the New Brunswick landscape, reflecting its variation in landform, geology and climate (abiotic features) (New Brunswick Department of Natural Resources 2007). These features influence the occurrence of terrestrial, coastal and aquatic ecosystems and their associated flora and fauna. The nested levels of the ELC are proposed as management units for terrestrial and coastal biodiversity.

Inland Aquatic Biodiversity

Aquatic biodiversity is influenced by both the abiotic features described in the ELC and the events, whether natural or human-caused, that take place upstream. The latter influence is the one that can be managed, and hence watersheds are proposed as management units for inland aquatic and wetland systems, and their associated flora and fauna. There are 13 large watersheds and many smaller ones.

Management Units for Biodiversity Conservation



Ecological Land Classification units are proposed for terrestrial and coastal ecosystems and consist of ecoregions (background colours), ecodistricts (heavy lines) and ecosections (fine lines).



Watersheds are proposed for inland aquatic and wetland systems and are classified as either major (background colours) or minor.

BIODIVERSITY ASSESSMENT AND INFORMATION SHARING

Our collective ability to move forward with the process of managing biodiversity requires knowledge of ecosystem function and population dynamics, as well as information on the current status and trends of biodiversity values. Given the vast amounts of potentially useful information, the process also requires that efforts be focused on priority ecosystems and species.

Many organizations currently generate and house these types of information, such as the New Brunswick Museum, The Atlantic Canada Conservation Data Centre, universities, environmental organizations, various federal and provincial government departments, and

landowners. Prioritizing among ecosystems and species, and making the data and knowledge gained known and accessible to planners and decision-makers, will facilitate improved stewardship by governments, corporations, private organizations, landowners and the public at large.

BIODIVERSITY THRESHOLDS AND TARGETS

Biodiversity **thresholds** describe the minimum or maximum level of a specific biodiversity value that is considered acceptable. They are usually used to describe the level at which the integrity of the value may be at some form of risk. Biodiversity **targets** are statements of desired outcomes related to specific biodiversity values. Biodiversity values are explicitly defined, and thresholds and targets are quantitative and measurable.



River Jewelwing
Calopteryx aequabilis
DNR Photo



Biodiversity targets can help to reduce conflicts between development and conservation interests via early identification of ecosystems and species that are of conservation concern. In tandem with monitoring, they allow for assessment of present status and proposed futures related to one or more biodiversity values, and can provide benchmarks against which to measure progress.

Biodiversity thresholds and targets will be developed for ecosystems and priority species to the extent needed to inform planning and decision-making. Thresholds and targets will be aimed at symptoms, such as reductions in population levels of certain species, and at their causes, such as the loss or disruption of ecosystems, or the establishment and spread of invasive alien species.

Thresholds will be developed by government departments with involvement from outside experts. The process will be science-based, will incorporate traditional knowledge and will be transparent. Targets will be set in consultation with stakeholders. They will be based on identified thresholds and the process will consider the implications to New Brunswick's social and economic well-being. Government will encourage and facilitate the adoption of targets by landowners.

INTEGRATED PLANNING

Integrated planning is a system that considers a broad range of resources and values for a planning area, for example, the economic, social, cultural and ecological values of a forest. Desired outcomes are explicitly described for all values and the planning process generates management scenarios that allow the outcomes to be met into the future. The process is key to maintaining biodiversity in managed ecosystems - decisions about the uses of land, water and biological resources can be made in the context of expected impacts to biodiversity values.

Biodiversity outcomes will be integrated into the planning and decision-making processes of Government, such as forest management planning for Crown land, environmental impact assessment, agriculture policies, and rural, municipal and regional planning.

Government will also encourage and facilitate the incorporation of biodiversity outcomes and beneficial management practices into planning for private land.

We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect."

- Aldo Leopold, from *A Sand County Almanac*, 1949

STEWARDSHIP

There are many variations to the meaning of stewardship, tailored to different sectors and interests. In the context of conservation and sustainable use, stewardship is landowners (including governments), corporations, organizations and individuals caring for land, water, air and biological resources, and sustaining the natural processes upon which life depends.

Webster's Dictionary defines **stewardship** as the individual's responsibility to manage his or her life and property with proper regard to the rights of others.

On Crown Land: Lead by Example

The Government of New Brunswick will lead by example. It will ensure that Crown land, water and biological resources are used and managed in a sustainable manner to achieve provincial biodiversity goals.

On Private Land: Encourage and Facilitate Stewardship

The stewardship of private lands and their biological resources is principally the responsibility of the owners and users of those lands. However, Government will work to encourage and facilitate stewardship through existing and new collaborative efforts. A variety of methods can be used:

- **Accessible Information**

- Educational materials to increase overall awareness
- Ecosystem status and trends information to identify priorities
- Technical how-to information, and
- Demonstration sites to show it can be done.

- **Networking**

Providing opportunities for organizations and individuals to share views on issues, successes and lessons learned helps to increase capacity and enthusiasm.

- **Collaboration**

Providing opportunities for organizations, including governments, to connect and collaborate can increase efficiency and the success of specific initiatives, and lead to greater levels of stewardship across the province.

- **Recognition**

Recognizing exceptional stewardship efforts gives credit to those who have worked hard and helps to profile issues and build momentum for action.

- **Incentives**

Though recognition from peers and the community at large is often a sufficient incentive for corporations and individuals to engage in stewardship, providing direct and indirect monetary incentives for significant contributions to achieving provincial biodiversity outcomes can further help to enhance stewardship in areas of high priority.

Education and Awareness

This strategy encourages us to be conservation-minded in our activities and decision-making. Education and awareness programs on the values of biodiversity and the need for its conservation will provide long-term benefits towards this end.

ACTION PLANS

Action plans will be developed that follow the broad direction provided in the strategy. These plans will be either sector-based or cross-sector in scope, and will identify actions that will help to achieve the management outcomes identified in Chapter 3. The plans will be developed collaboratively with stakeholders and will build on the existing initiatives of governments, corporations, non-government organizations and individuals. Plan development will be led by the Departments of Natural Resources, Environment, Agriculture and Aquaculture, and Local Government. Plans will have finite life spans in the order of five years and progress will be tracked by the Biodiversity Secretariat.

REPORTING

Reporting on biodiversity indicators and management actions will provide accountability and a measure of progress.

Management Performance

The management outcomes identified in Chapter 3 identify broad-scale processes for achieving conservation and sustainable-use outcomes. Performance on achieving these management outcomes will be reported regularly.

Biodiversity Status and Trends

Reporting on the status and trends of biodiversity within the province will serve to identify successes and challenges, to gauge progress, and to inform planning. Biodiversity indicators will be reported by management unit at least every 10 years. Though the set of conservation and sustainable-use indicators has not been defined for New Brunswick, there is a substantial amount of information currently collected and reported for different sectors at various ecological and administrative scales. This information can be used to gain insight into the current state of biodiversity and to help focus future reporting.



Canada Lily
Lilium canadense
DNR Photo

CHAPTER 3

BIODIVERSITY MANAGEMENT OUTCOMES

Improving our ability to achieve conservation and sustainable-use outcomes will require focus, clear targets, new approaches to management, and an exceptional level of collaboration among organizations.

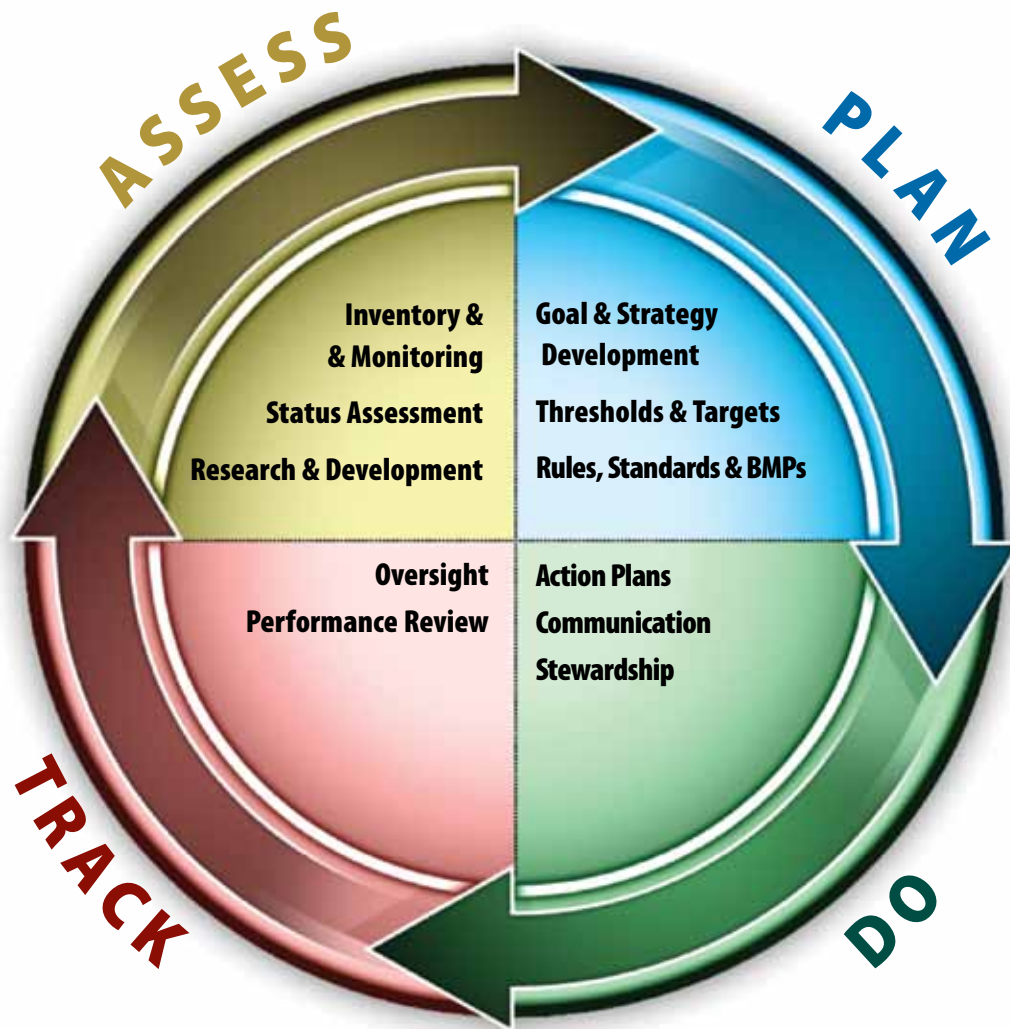


Long-tailed duck
Clangula hyemalis
DNR Photo

Improving our ability to achieve conservation and sustainable-use outcomes will require focus, clear targets, new approaches to management, and an exceptional level of collaboration among organizations.

A set of 20 strategic *management outcomes* have been identified that describe where we need to be, in terms of management capacity, in order to move towards meeting biodiversity outcomes. They are general statements, in that they provide broad direction rather than specific actions, and because they apply to many sectors and types of activities. They are intended to supply guidance for the work of developing action plans.

The management outcomes are presented here within a strategic hierarchy that follows on the one developed by the Canadian Council of Resource Ministers in the 2006 document *A Biodiversity Outcomes Framework for Canada*. There are four broad types of management outcomes, related to either: 1) assessment of the state of biodiversity (**Assess**); 2) goals, planning, thresholds and targets, and management protocols (**Plan**); 3) processes for moving the strategy forward (**Do**); and 4) tracking the implementation of management activities (**Track**).



ASSESS - Inventory and Monitoring

1) Inventory and monitoring activities include the data needed for assessment of biodiversity and for improving management capacity towards meeting biodiversity conservation and sustainable use outcomes.

Examples of existing activities that do, or could, contribute to this outcome are:

- Collection and interpretation of forest inventory data
- Monitoring of terrestrial and aquatic species
- Population surveys and threat-monitoring for species of conservation concern
- Registration of harvested wildlife, and collection of effort and success data
- Collection and interpretation of water-quality data
- Monitoring activities related to environmental impact assessment
- Collection and interpretation of agricultural land inventory data, and
- Monitoring of insects, disease, competition and invasive alien species.

ASSESS - Status Assessment

2) The conservation status of forest, wetland, aquatic and coastal ecosystems, and of selected species, is regularly assessed and reported.

Examples of existing activities that contribute to this outcome are:

- General status of wildlife species
- Status of species of conservation concern
- Status of forest, wetland and aquatic ecosystems
- Environmental impact assessment, and
- Assessment of the health of agricultural riparian areas.

ASSESS - Research and Development

3) The capacity for assessment and management of forest, wetland, aquatic, coastal and agricultural ecosystems, and of their constituent species, is enhanced through research and development.

Examples of existing activities that contribute to this outcome are:

- Research on the relationships between species and their habitats
- Research on the development of forest stands in response to treatments and in their absence
- Development of approaches and techniques for strategic planning related to both use and conservation of biodiversity
- Research on sustainable production of livestock and crops, and the effects of activities on watersheds, natural ecosystems and species
- Research on sustainable production of aquaculture products, and the effects of activities on aquatic ecosystems
- Development of capacity in the biological sciences, in particular in systematics, and
- Synthesis of expected changes in climate and responses of natural and modified ecosystems.



Barred Owl
Strix varia
DNR Photo

PLAN - Goal Development

- 4) Provincial goal statements for forest, wetland, aquatic and coastal ecosystems, and their constituent species, are maintained and address conservation and sustainable use.**

Examples of existing documents that contribute to this outcome are:

- The New Brunswick Public Forest – Our Shared Future
- A Coastal Areas Protection Policy for New Brunswick
- The New Brunswick Wetlands Conservation Policy, and
- Growing Forward (Agricultural Policy Framework)

- 5) Goal statements for provincial parks and Protected Natural Areas are maintained and address their role in the conservation of biodiversity.**

- 6) Provincial goal statements for industrial sectors, in particular forestry, agriculture, aquaculture, fisheries, energy and transportation, are maintained and address both the sustainable production of products and services and the relationships between industrial activities and biodiversity.**

- 7) Goal statements for municipalities, rural communities and regional planning units acknowledge the contribution of local biodiversity towards meeting provincial biodiversity goals and outcomes.**

PLAN - Strategy Development

- 8) Provincial goals, outcomes and targets for biodiversity are considered in the development of forest, water and species management plans, in plans for provincial parks and Protected Natural Areas, in regional, municipal and rural plans, in agricultural plans, in integrated provincial plans, and in environmental assessments of proposed development activities.**

Examples of existing activities that do, or could, contribute to this outcome are:

- Forest management planning for Crown land
- Watershed management and enhancement of aquatic habitat
- Recovery planning for species at risk
- Management planning for harvested wildlife species
- Surface water protection planning
- Wetland and coastal area conservation planning
- Regional, municipal and rural planning
- Agricultural policy development
- Planning for livestock and crop production
- Integrated pest management
- Land enhancement and development planning for agriculture, and
- Environmental farm planning.

- 9) A strategy for climate change provides mitigation and adaptation opportunities for ecologically, socially or economically important ecosystems and species.**

An example of an existing document that contributes to this outcome is the *New Brunswick Climate Change Action Plan*.

Macintosh Apples
Crispantasia
DAA Photo

10) A strategy for invasive alien species provides mitigation and adaptation opportunities for ecologically, socially or economically important ecosystems and species.

Examples of existing documents that contribute to this outcome are:

- Invasive Alien Species Strategy for Canada
- Proposed Action Plan for Invasive Alien Terrestrial Plants and Plant Pests (Canada)
- Canadian Action Plan to Address the Threat of Aquatic Invasive Species

PLAN - Thresholds and Targets

11) Biodiversity thresholds and targets are established on defined management units for forest, wetland, aquatic and coastal ecosystem types, and for selected species.

An example of an existing activity that contributes to this outcome is the establishment of thresholds for old-forest habitat and old-forest vegetation communities for Crown land.

12) Biodiversity targets are established for provincial parks and Protected Natural Areas that support or enhance the targets for the biodiversity management units in which they occur.

PLAN - Rules, Standards and Beneficial Management Practices

13) Acts, regulations, policies, standards and beneficial management practices (BMPs) for land, water, soil and species management are consistent with achieving biodiversity conservation and sustainable-use outcomes.

Examples of existing activities that do or could contribute to this outcome are:

- Rules, standards and BMPs for forest operations - harvesting, silviculture, roads, and insect and competition control
- Rules, standards and BMPs for surface water protection, watercourse and wetland alteration, and watercourse buffers
- Rules and BMPs for coastal area activities
- Rules and standards for industrial and municipal water discharge
- Standards for assessment of environmental impacts of proposed development
- Rules for introducing, transferring, feeding and baiting of wildlife, and for holding them in captivity, and
- Agricultural beneficial management practices.



Great Blue Heron
Ardea herodias
DNR Photo

D0 - Action Plans

- 14) Action plans are in place to improve our ability to achieve biodiversity conservation and sustainable-use outcomes.

D0 - Communication

- 15) A communication plan for biodiversity increases understanding among individuals, corporations and organizations of the multiple values of biodiversity, the need to contribute to its conservation, and the need to participate in the decision-making process.

- 16) Scientific and other information that supports the conservation and sustainable use of biodiversity is easily accessible to stakeholders and citizens.

D0 - Stewardship

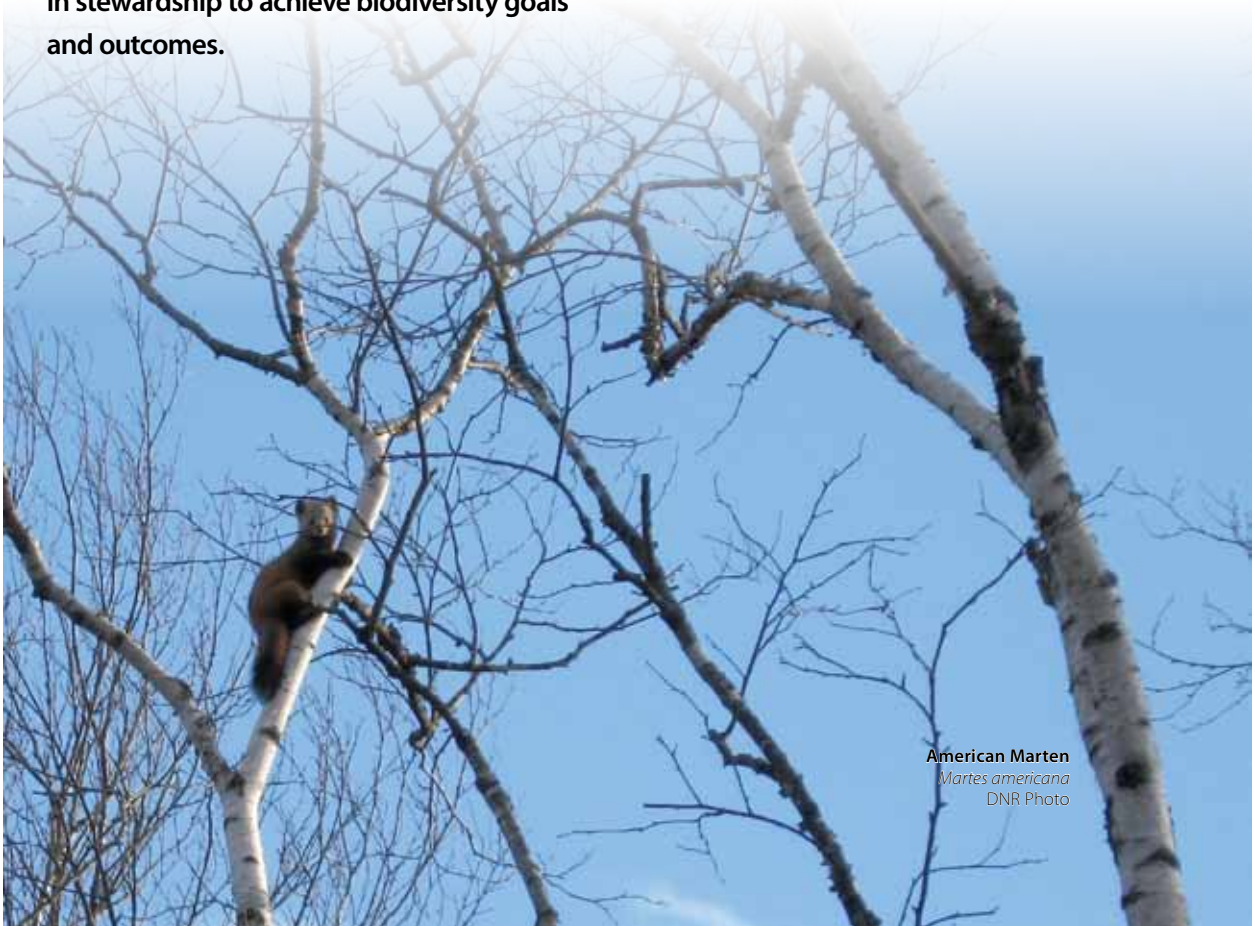
- 17) Governments, First Nations, corporations, private organizations, landowners and the public at large are engaged and collaborating in stewardship to achieve biodiversity goals and outcomes.

TRACK - Oversight

- 18) Criteria and standards for oversight and regulation of activities that affect land, water, air or species, and for public funding of private-land management, include those required for assessment of biodiversity values.

TRACK - Performance Review

- 19) Progress towards achieving biodiversity management outcomes and towards implementing action plans is regularly reviewed and reported.
- 20) The New Brunswick Biodiversity Strategy is reviewed and updated at intervals of no greater than 10 years.



American Marten
Martes americana
DNR Photo

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NEW BRUNSWICK BIODIVERSITY WORKING GROUP

The New Brunswick Biodiversity Working Group was established in 2005 to develop the New Brunswick Biodiversity Strategy. Members included:

Charles Ayer	Department of Natural Resources
Dan Beaudette	Department of Natural Resources
Jennifer Dunlap	Department of Natural Resources
Brent Evered	Department of Natural Resources
Steve Gordon	Department of Natural Resources (Chair)
Lucie Lavoie	Department of Natural Resources
Mike Montigny	Department of Natural Resources
Garth Nickerson	Department of Agriculture and Aquaculture
Mike Phillips	Department of Transportation
Bonnie Robertson	Department of Agriculture and Aquaculture
Johnny St-Onge	Department of Local Government
Bruce Thorpe	Department of Agriculture and Aquaculture
Jane Tims	Department of Environment

CONTACT INFORMATION

For further information, or to provide comments on this document, please contact:

New Brunswick Biodiversity Secretariat at (506) 453-2440, or write to:

Department of Natural Resources, Fish and Wildlife Branch, P.O. Box 6000 Fredericton NB, E3B 5H1.

This document is available on-line at: www.gnb.ca/naturalresources



Bald Eagle
Haliaeetus leucocephalus
Photo Canada